

PATENT ABSTRACTS OF JAPAN

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(71)Applicant : MATSUSHITA ELECTRIC IND CO LTD

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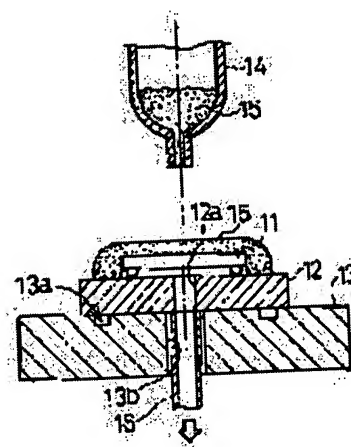
(72)Inventor : NISHINO KENICHI
KABESHITA AKIRA
KANAYAMA SHINJI
ENCHI KOUHEI

(54) SEALING BOARD OF IC CHIP AND SEALING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain the sealing board of an IC chip, the method of sealing and a sealing device with high productivity by providing a sealing material sucking hole through which the sealing material applied around the IC chip mounted on a mounting position is sucked and filling the gap between the IC chip and the sealing board with the sucked sealing material.

SOLUTION: A sealing material applying means 14, which moves in the direction of X, Y and Z relatively to a sealing stage 13, applies sealing material 15 around an IC chip 11 mounted on a sealing board 12. The sealing material sucking means 16 sucks the sealing material 15 applied to the IC chip 11 through a sealing material sucking through hole 12a and sealing material sucking hole 13b, and fills the gap between the IC chip 11 and the sealing board 12 with the sucked sealing material 15 by force. Therefore, the productivity is improved drastically compared with the case before of flowing the sealing material into the gap between the IC chip and the board with the help of the inclination of the sealing board for a long time of 10 minutes.



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CLAIMS

[Claim(s)]

[Claim 1] The closure substrate of IC chip characterized by establishing the sealing agent attraction hole filled up with the sealing agent with which the sealing agent applied to the periphery of IC chip mounted in said mounting position was attracted, and the above attracted the clearance between said IC chips and said closure substrates in IC chip mounting position of the closure substrate which carries out flip chip mounting of the IC chip.

[Claim 2] The closure substrate of IC chip characterized by establishing the sealing agent impregnation hole which pours into the clearance between said IC chips and said closure substrates the sealing agent which closes IC chip mounted in said mounting position in IC chip mounting position of the closure substrate which carries out flip chip mounting of the IC chip.

[Claim 3] A sealing agent attraction hole is established in IC chip mounting position of the closure substrate which carries out flip chip mounting of the IC chip. Mount IC chip in said mounting position, and a sealing agent is applied to the periphery of said mounted IC chip. The closure approach of IC chip characterized by filling up with the sealing agent with which said applied sealing agent was attracted and the above attracted the clearance between said IC chips and said closure substrates from said sealing agent attraction hole on the background of the closure substrate side which mounted said IC chip.

[Claim 4] The closure approach of the IC chip characterized by to fill up with the sealing agent with which the sealing agent was poured in and the above poured in the clearance between said IC chips and said closure substrates from said sealing agent impregnation hole on the background of the closure substrate side which established the sealing agent impregnation hole in IC chip mounting position of the closure substrate which carries out flip chip mounting of the IC chip, mounted IC chip in said mounting position, and mounted said IC chip.

[Claim 5] The closure stage which has a maintenance means to hold the closure substrate which carries out flip chip mounting of the IC chip, and the sealing agent attraction through hole prepared according to the sealing agent attraction hole in IC chip mounting position of said closure substrate, A sealing agent spreading means to apply a sealing agent to the periphery of IC chip mounted in said closure substrate, The sealing arrangement of IC chip characterized by having a sealing agent attraction means to fill up with the sealing agent with which the sealing agent applied to the periphery of said IC chip through said sealing agent attraction through hole and said sealing agent attraction hole was attracted, and the above attracted the clearance between said IC chips and said closure substrates.

[Claim 6] The sealing arrangement of the IC chip carry out pouring in a sealing agent through the closure stage which has a maintenance means hold the closure substrate which carries out flip chip mounting of the IC chip, and the sealing agent impregnation through hole which prepared according to the sealing agent impregnation hole in IC chip mounting position of said closure substrate, and said sealing agent impregnation through hole and said sealing agent impregnation hole, and having said IC chip and a sealing agent impregnation means are filled up with the sealing agent of the above [the clearance between said closure substrates] which poured in as the description.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the closure approach and substrate of IC chip in a flip chip mounting process.

[0002]

[Description of the Prior Art] In the MCM (multi chip module) mounting process of having used the flip chip mounting process of recently having been brought into the limelight, and flip chip mounting, the approach shown in drawing 5 from the former is common as the closure approach performed after IC chip mounting.

[0003] The conventional example of the closure approach is heated by predetermined temperature, for example, 60-degreeC, in drawing 5. Adsorption immobilization of the substrate 3 with which the IC chip 2 was mounted to the level surface on the predetermined include angle theta 1, for example, the block leaned 15 degrees, is carried out. A sealing agent (epoxy phenol resin) 5 is applied to upper edge part 2a of the IC chip 2 with a dispenser 4, and by 15-degree dip, a sealing agent 5 flows in between the IC chip 2 and a substrate 3, and closes.

[0004]

[Problem(s) to be Solved by the Invention] However, with the configuration of the above-mentioned conventional example, since it closes by the flow of the sealing agent by dip, closure time amount is long and the trouble that starting productivity is low is in closure of one IC chip for about 10 minutes. In order to make [many] a volume, it is necessary to make [many] the number of stages which does a closure activity, and leads to the trouble that facility cost becomes high.

[0005] This invention solves the above-mentioned trouble and productivity aims [this invention] at offer of the closure substrate of high IC chip, the closure approach, and a sealing arrangement.

[0006]

[Means for Solving the Problem] In order that the closure substrate of IC chip of the 1st invention of this application may solve the above-mentioned technical problem, it carries out having established the sealing agent attraction hole filled up with the sealing agent with which the sealing agent applied to the periphery of IC chip mounted in said mounting position was attracted, and the above attracted the clearance between said IC chips and said closure substrates in IC chip mounting position of the closure substrate which carries out flip chip mounting of the IC chip as the description.

[0007] The closure substrate of IC chip of the 2nd invention of this application is characterized by establishing the sealing agent impregnation hole which pours into the clearance between said IC chips and said closure substrates the sealing agent which closes IC chip mounted in said mounting position in IC chip mounting position of the closure substrate which carries out flip chip mounting of the IC chip, in order to solve the above-mentioned technical problem.

[0008] In order that the closure approach of IC chip the 3rd invention of this application may solve the above-mentioned technical problem A sealing agent attraction hole is established in IC chip mounting position of the closure substrate which carries out flip chip mounting of the IC chip. Mount IC chip in

said mounting position, and a sealing agent is applied to the periphery of said mounted IC chip. It is characterized by filling up with the sealing agent with which said applied sealing agent was attracted and the above attracted the clearance between said IC chips and said closure substrates from said sealing agent attraction hole on the background of the closure substrate side which mounted said IC chip.

[0009] In order that the closure approach of the IC chip the 4th invention of this application may solve the above-mentioned technical problem, it carries out pouring in a sealing agent from said sealing agent impregnation hole on the background of the closure substrate side which established the sealing agent impregnation hole in IC chip mounting position of the closure substrate which carries out flip chip mounting of the IC chip, mounted IC chip in said mounting position, and mounted said IC chip, and being filled up with the sealing agent of the above [the clearance between said IC chips and said closure substrates] poured in as the description.

[0010] In order that the sealing arrangement of IC chip of the 5th invention of this application may solve the above-mentioned technical problem The closure stage which has a maintenance means to hold the closure substrate which carries out flip chip mounting of the IC chip, and the sealing agent attraction through hole prepared according to the sealing agent attraction hole in IC chip mounting position of said closure substrate, A sealing agent spreading means to apply a sealing agent to the periphery of IC chip mounted in said closure substrate, It is characterized by having a sealing agent attraction means to fill up with the sealing agent with which the sealing agent applied to the periphery of said IC chip through said sealing agent attraction through hole and said sealing agent attraction hole was attracted, and the above attracted the clearance between said IC chips and said closure substrates.

[0011] In order that the sealing arrangement of IC chip of the 6th invention of this application may solve the above-mentioned technical problem The closure stage which has a maintenance means to hold the closure substrate which carries out flip chip mounting of the IC chip, and the sealing agent impregnation through hole prepared according to the sealing agent impregnation hole in IC chip mounting position of said closure substrate, It is characterized by having a sealing agent impregnation means to fill up with the sealing agent with which the sealing agent was poured in through said sealing agent impregnation through hole and said sealing agent impregnation hole, and the above poured in the clearance between said IC chips and said closure substrates.

[0012]

[Function] The closure substrate of IC chip of the 1st invention of this application, the closure approach of IC chip the 3rd invention of this application, and the sealing arrangement of IC chip of the 5th invention of this application It has a sealing agent attraction hole in the location where a closure substrate should carry out flip chip mounting of the IC chip. A closure stage has a maintenance means to hold said closure substrate, and the sealing agent attraction through hole prepared according to the sealing agent attraction hole in IC chip mounting position of said closure substrate. A sealing agent spreading means applies a sealing agent to the periphery of IC chip mounted in said closure substrate. Since a sealing agent attraction means fills up with the sealing agent with which the sealing agent applied to the periphery of said IC chip through said sealing agent attraction through hole and said sealing agent attraction hole was attracted, and the above attracted the clearance between said IC chips and said closure substrates compulsorily In the conventional example, the dip of a closure substrate is used and productivity improves substantially as compared with slushing a sealing agent into the clearance between IC chip and a closure substrate over the long time amount for about 10 minutes.

[0013] The closure substrate of IC chip of the 2nd invention of this application, the closure approach of IC chip the 4th invention of this application, and the sealing arrangement of IC chip of the 6th invention of this application It has a sealing agent impregnation hole in the location where a closure substrate should carry out flip chip mounting of the IC chip. A closure stage has a maintenance means to hold said closure substrate, and the sealing agent impregnation through hole prepared according to the sealing agent impregnation hole in IC chip mounting position of said closure substrate. Since a sealing agent impregnation means pours in a sealing agent through said sealing agent impregnation through hole and said sealing agent impregnation hole and fills up compulsorily the clearance between said IC chips and said closure substrates with said sealing agent In the conventional example, the dip of a closure substrate

is used and productivity improves substantially as compared with slushing a sealing agent into the clearance between IC chip and a substrate over the long time amount for about 10 minutes.

[0014]

[Example] The 1st example of the sealing arrangement of IC chip which uses the closure substrate of IC chip of this invention and the closure approach of IC chip is explained based on drawing 1 and drawing 2.

[0015] In drawing 1 and drawing 2, flip chip mounting of the IC chip 11 is carried out at the closure substrate 12. It has sealing agent attraction hole 12a in the location where the closure substrate 12 should carry out flip chip mounting of the IC chip 11. It has adsorption slot 13a to which the closure stage 13 adsorbs and holds the substrate which should carry out flip chip mounting of the IC chip, and sealing agent attraction through hole 13b prepared according to sealing agent attraction hole 12a in IC chip mounting position of the closure substrate 12. The sealing agent spreading means 14 which can be displaced relatively in the XYZ direction to the closure stage 13 A sealing agent 15 is applied to the periphery of the IC chip 11 mounted in the closure substrate 12. Since the sealing agent attraction means 16 fills up with the sealing agent 15 with which the sealing agent 15 applied to the IC chip 11 through said sealing agent attraction through hole 12a and said sealing agent attraction hole 13b was attracted, and the above attracted the clearance between said IC chips 11 and said closure substrates 12 compulsorily, in the conventional example The dip of a closure substrate is used and productivity improves substantially as compared with slushing a sealing agent into the clearance between IC chip and a substrate over the long time amount for about 10 minutes.

[0016] In this case, as mentioned above, although the sealing agent 15 is applied to the IC chip 11 whole in drawing 2, if a sealing agent 15 is applied the periphery of the IC chip 11, i.e., each side of the IC chip 11, the clearance between said IC chips 11 and said closure substrates 12 can be compulsorily filled up with a sealing agent 15 by attraction of the sealing agent attraction means 16.

[0017] Moreover, although one IC chip is mounted and enclosed with the closure substrate 12 in this example, it does not restrict to one piece but, of course, also in two or more cases, is.

[0018] The 2nd example of the sealing arrangement of IC chip which uses the closure substrate of IC chip of this invention and the closure approach of IC chip is explained based on drawing 3 and drawing 4.

[0019] In drawing 3 and drawing 4, flip chip mounting of the IC chip 21 is carried out at the closure substrate 22. And adsorption maintenance of the IC chip 21 is carried out by IC adsorption tool 26. It has sealing agent impregnation hole 22a in the location where the closure substrate 22 should carry out flip chip mounting of the IC chip 21. It has sealing agent impregnation through hole 23b prepared according to adsorption slot 23a to which the closure stage 23 adsorbs and holds the closure substrate 22 which should carry out flip chip mounting of the IC chip 21, and sealing agent impregnation hole 22a in IC chip mounting position of said closure substrate 22. The sealing agent impregnation means 24 Since it fills up with the sealing agent 25 with which the sealing agent 25 was poured in through said sealing agent impregnation through hole 23b and said sealing agent impregnation hole 22a, and the above poured in the clearance between said IC chips 21 and said closure substrates 22 compulsorily In the conventional example, the dip of a closure substrate is used and productivity improves substantially as compared with slushing a sealing agent into the clearance between IC chip and a closure substrate over the long time amount for about 10 minutes.

[0020] In this case, if viscosity by temperature management of enclosure material is adjusted proper, it is possible to close [be / it / under / flip chip mounting / concurrency].

[0021] Moreover, if up Shimonoseki charge of IC adsorption tool 26 of drawing 4 and the sealing agent impregnation means 24 is made into reverse, gravity will act on a direction of grouting and impregnation will become easy.

[0022]

[Effect of the Invention] The closure substrate of IC chip of the 1st invention of this application, the closure approach of IC chip the 3rd invention of this application, and the sealing arrangement of IC chip of the 5th invention of this application Since it fills up with the sealing agent with which the sealing

agent attraction means attracted the sealing agent applied to the periphery of IC chip, and attracted the clearance between IC chip and a closure substrate compulsorily, in the conventional example The dip of a closure substrate is used and the effectiveness that productivity improves substantially is done so as compared with slushing a sealing agent into the clearance between IC chip and a closure substrate over the long time amount for about 10 minutes.

[0023] The closure substrate of IC chip of the 2nd invention of this application, the closure approach of IC chip the 4th invention of this application, and the sealing arrangement of IC chip of the 6th invention of this application Since a sealing agent impregnation means fills up with the sealing agent which poured in the sealing agent and poured in the clearance between IC chip and a closure substrate compulsorily, in the conventional example The dip of a closure substrate is used and the effectiveness that productivity improves substantially is done so as compared with slushing a sealing agent into the clearance between IC chip and a closure substrate over the long time amount for about 10 minutes.

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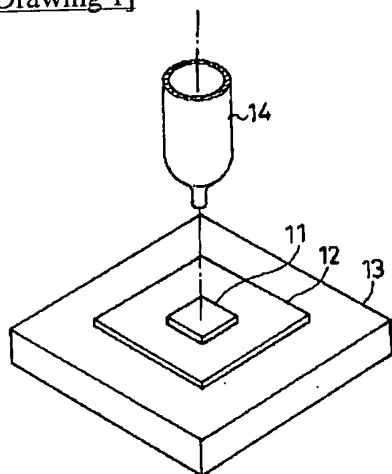
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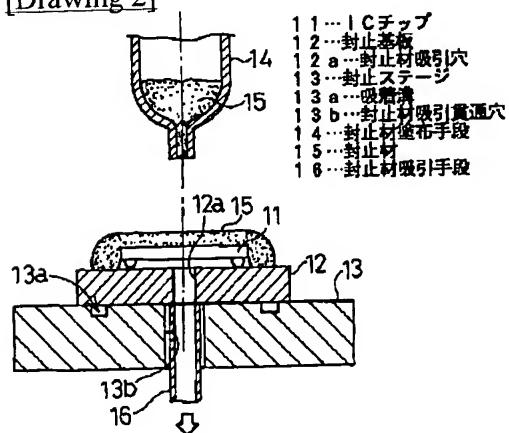
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DRAWINGS

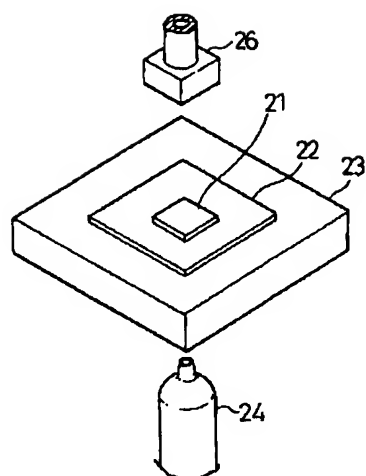
[Drawing 1]



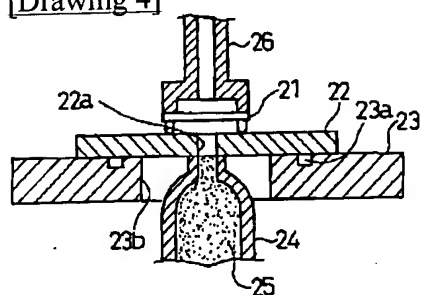
[Drawing 2]



[Drawing 3]

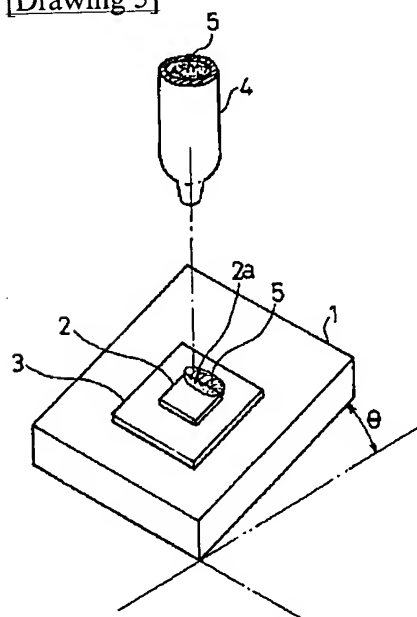


[Drawing 4]



- | | |
|--------------|----------------|
| 21...ICチップ | 23b...封止材注入貫通穴 |
| 22...封止基板 | 24...封止材注入手段 |
| 22a...封止材注入穴 | 25...封止材 |
| 23...封止ステージ | 26...IC吸着ツール |
| 23a...吸着溝 | |

[Drawing 5]



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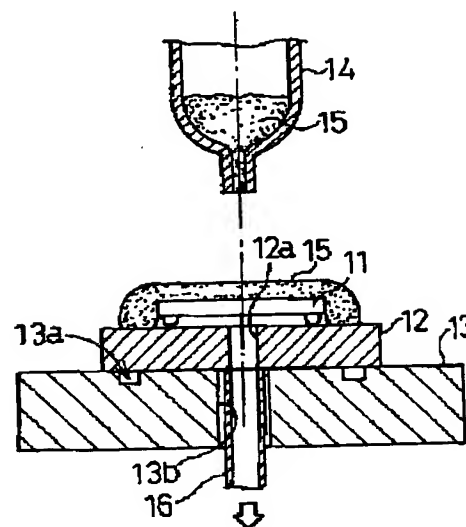
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INVENTOR : ENCHI KOUHEI;

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TITLE : SEALING BOARD OF IC CHIP AND
 SEALING DEVICE



ABSTRACT : PROBLEM TO BE SOLVED: To obtain the sealing board of an IC chip, the method of sealing and a sealing device with high productivity by providing a sealing material sucking hole through which the sealing material applied around the IC chip mounted on a mounting position is sucked and filling the gap between the IC chip and the sealing board with the sucked sealing material.

SOLUTION: A sealing material applying means 14, which moves in the direction of X, Y and Z relatively to a sealing stage 13, applies sealing material 15 around an IC chip 11 mounted on a sealing board 12. The sealing material sucking means 16 sucks the sealing material 15 applied to the IC chip 11 through a sealing material sucking through hole 12a and sealing material sucking hole 13b, and fills the gap between the IC chip 11 and the sealing board 12 with the sucked sealing material 15 by force. Therefore, the productivity is improved drastically compared with the case before of flowing the sealing material into the gap between the IC chip and the board with the help of the inclination of the sealing board for a long time of 10 minutes.

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(71)出願人 000005821

松下電器産業株式会社

大阪府門真市大字門真1006番地

(72)発明者 西野 賢一

大阪府門真市大字門真1006番地 松下電器
産業株式会社内

(72)発明者 壁下 朗

大阪府門真市大字門真1006番地 松下電器
産業株式会社内

(72)発明者 金山 真司

大阪府門真市大字門真1006番地 松下電器
産業株式会社内

(74)代理人 弁理士 石原 勝

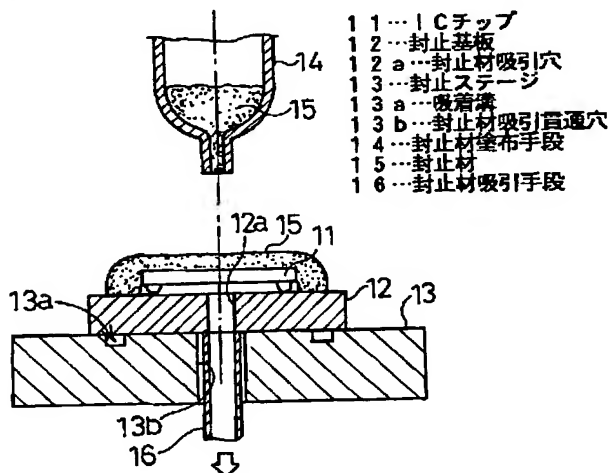
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(54)【発明の名称】 I Cチップの封止基板と封止方法と封止装置

(57)【要約】

【目的】 生産性が高いI Cチップの封止装置の提供。

【構成】 I Cチップ11をフリップチップ実装する封止基板12を保持する保持手段13aと前記封止基板12のI Cチップ実装位置にある封止材吸引穴12aに合わせて設けた封止材吸引貫通穴13bとを有する封止ステージ13と、前記封止基板12に実装されたI Cチップ11の周縁に封止材15を塗布する封止材塗布手段14と、前記封止材吸引貫通穴13bと前記封止材吸引穴12aとを通して前記I Cチップ11の周縁に塗布された封止材15を吸引し前記I Cチップ11と前記封止基板12間の隙間を前記の吸引した封止材15で充填する封止材吸引手段16とを備える。



【特許請求の範囲】

【請求項1】 ICチップをフリップチップ実装する封止基板のICチップ実装位置に、前記実装位置に実装したICチップの周縁に塗布した封止材を吸引し前記ICチップと前記封止基板間の隙間を前記の吸引した封止材で充填する封止材吸引穴を設けたことを特徴とするICチップの封止基板。

【請求項2】 ICチップをフリップチップ実装する封止基板のICチップ実装位置に、前記実装位置に実装したICチップを封止する封止材を前記ICチップと前記封止基板間の隙間に注入する封止材注入穴を設けたことを特徴とするICチップの封止基板。

【請求項3】 ICチップをフリップチップ実装する封止基板のICチップ実装位置に封止材吸引穴を設け、前記実装位置にICチップを実装し、前記実装したICチップの周縁に封止材を塗布し、前記ICチップを実装した封止基板面の裏側の前記封止材吸引穴より前記塗布された封止材を吸引し前記ICチップと前記封止基板間の隙間を前記の吸引した封止材で充填することを特徴とするICチップの封止方法。

【請求項4】 ICチップをフリップチップ実装する封止基板のICチップ実装位置に封止材注入穴を設け、前記実装位置にICチップを実装し、前記ICチップを実装した封止基板面の裏側の前記封止材注入穴より封止材を注入し前記ICチップと前記封止基板間の隙間を前記の注入した封止材で充填することを特徴とするICチップの封止方法。

【請求項5】 ICチップをフリップチップ実装する封止基板を保持する保持手段と前記封止基板のICチップ実装位置にある封止材吸引穴に合わせて設けた封止材吸引貫通穴とを有する封止ステージと、前記封止基板に実装されたICチップの周縁に封止材を塗布する封止材塗布手段と、前記封止材吸引貫通穴と前記封止材吸引穴とを通して前記ICチップの周縁に塗布された封止材を吸引し前記ICチップと前記封止基板間の隙間を前記の吸引した封止材で充填する封止材吸引手段とを備えることを特徴とするICチップの封止装置。

【請求項6】 ICチップをフリップチップ実装する封止基板を保持する保持手段と前記封止基板のICチップ実装位置にある封止材注入穴に合わせて設けた封止材注入貫通穴とを有する封止ステージと、前記封止材注入貫通穴と前記封止材注入穴とを通して封止材を注入し前記ICチップと前記封止基板間の隙間を前記の注入した封止材で充填する封止材注入手段とを備えることを特徴とするICチップの封止装置。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、フリップチップ実装工程でのICチップの封止方法とその基板に関するものである。

【0002】

【従来の技術】最近になって脚光を浴びてきたフリップチップ実装工程やフリップチップ実装を利用したMCM（マルチチップモジュール）実装工程において、ICチップ実装後に行う封止方法としては、従来から図5に示す方法が一般的である。

【0003】図5において、封止方法の従来例は、所定温度、例えば60℃に加熱され、水平面に対し所定角度 θ 、例えば15°傾けたブロック1の上に、ICチップ2が実装された基板3を吸着固定し、ディスペンサー4により封止材（エポキシフェノール樹脂）5を、ICチップ2の上辺部2aに塗布し、封止材5が、15°の傾斜によってICチップ2と基板3との間に流れ込んで封止するものである。

【0004】

【発明が解決しようとする課題】しかし、上記の従来例の構成では、傾斜による封止材の流れで封止を行うので封止時間が長く1個のICチップの封止に約10分かかり生産性が低いという問題点がある。生産量を多くするには、封止作業をするステージ数を多くする必要がある、設備コストが高くなるという問題点につながる。

【0005】本発明は、上記の問題点を解決し、生産性が高いICチップの封止基板と封止方法と封止装置の提供を目的とする。

【0006】

【課題を解決するための手段】本願第1発明のICチップの封止基板は、上記の課題を解決するために、ICチップをフリップチップ実装する封止基板のICチップ実装位置に、前記実装位置に実装したICチップの周縁に塗布した封止材を吸引し前記ICチップと前記封止基板間の隙間を前記の吸引した封止材で充填する封止材吸引穴を設けたことを特徴とする。

【0007】本願第2発明のICチップの封止基板は、上記の課題を解決するために、ICチップをフリップチップ実装する封止基板のICチップ実装位置に、前記実装位置に実装したICチップを封止する封止材を前記ICチップと前記封止基板間の隙間に注入する封止材注入穴を設けたことを特徴とする。

【0008】本願第3発明のICチップの封止方法は、上記の課題を解決するために、ICチップをフリップチップ実装する封止基板のICチップ実装位置に封止材吸引穴を設け、前記実装位置にICチップを実装し、前記実装したICチップの周縁に封止材を塗布し、前記ICチップを実装した封止基板面の裏側の前記封止材吸引穴より前記塗布された封止材を吸引し前記ICチップと前記封止基板間の隙間を前記の吸引した封止材で充填することを特徴とする。

【0009】本願第4発明のICチップの封止方法は、上記の課題を解決するために、ICチップをフリップチップ実装する封止基板のICチップ実装位置に封止材注

入穴を設け、前記実装位置にICチップを実装し、前記ICチップを実装した封止基板面の裏側の前記封止材注入穴より封止材を注入し前記ICチップと前記封止基板間の隙間を前記の注入した封止材で充填することとを特徴とする。

【0010】本願第5発明のICチップの封止装置は、上記の課題を解決するために、ICチップをフリップチップ実装する封止基板を保持する保持手段と前記封止基板のICチップ実装位置にある封止材吸引穴に合わせて設けた封止材吸引貫通穴とを有する封止ステージと、前記封止基板に実装されたICチップの周縁に封止材を塗布する封止材塗布手段と、前記封止材吸引貫通穴と前記封止材吸引穴とを通して前記ICチップの周縁に塗布された封止材を吸引し前記ICチップと前記封止基板間の隙間を前記の吸引した封止材で充填する封止材吸引手段とを備えることを特徴とする。

【0011】本願第6発明のICチップの封止装置は、上記の課題を解決するために、ICチップをフリップチップ実装する封止基板を保持する保持手段と前記封止基板のICチップ実装位置にある封止材注入穴に合わせて設けた封止材注入貫通穴とを有する封止ステージと、前記封止材注入貫通穴と前記封止材注入穴とを通して封止材を注入し前記ICチップと前記封止基板間の隙間を前記の注入した封止材で充填する封止材注入手段とを備えることを特徴とする。

【0012】

【作用】本願第1発明のICチップの封止基板と、本願第3発明のICチップの封止方法と、本願第5発明のICチップの封止装置とは、封止基板が、ICチップをフリップチップ実装すべき位置に封止材吸引穴を有し、封止ステージが、前記封止基板を保持する保持手段と前記封止基板のICチップ実装位置にある封止材吸引穴に合わせて設けた封止材吸引貫通穴とを有し、封止材塗布手段が、前記封止基板に実装されたICチップの周縁に封止材を塗布し、封止材吸引手段が、前記封止材吸引貫通穴と前記封止材吸引穴とを通して前記ICチップの周縁に塗布された封止材を吸引し前記ICチップと前記封止基板間の隙間を前記の吸引した封止材で強制的に充填するので、従来例では、封止基板の傾斜を利用し、10分位の長い時間をかけて封止材をICチップと封止基板間の隙間に流し込むのに比較して、生産性が大幅に向上する。

【0013】本願第2発明のICチップの封止基板と、本願第4発明のICチップの封止方法と、本願第6発明のICチップの封止装置とは、封止基板が、ICチップをフリップチップ実装すべき位置に封止材注入穴を有し、封止ステージが、前記封止基板を保持する保持手段と前記封止基板のICチップ実装位置にある封止材注入穴に合わせて設けた封止材注入貫通穴とを有し、封止材注入手段が、前記封止材注入貫通穴と前記封止材注入穴

とを通して封止材を注入し前記ICチップと前記封止基板間の隙間を前記封止材で強制的に充填するので、従来例では、封止基板の傾斜を利用し、10分位の長い時間をかけて封止材をICチップと基板間の隙間に流し込むのに比較して、生産性が大幅に向上する。

【0014】

【実施例】本発明のICチップの封止基板とICチップの封止方法とを使用するICチップの封止装置の第1実施例を図1、図2に基づいて説明する。

【0015】図1、図2において、ICチップ11が封止基板12にフリップチップ実装されている。封止基板12が、ICチップ11をフリップチップ実装すべき位置に封止材吸引穴12aを有し、封止ステージ13が、ICチップをフリップチップ実装すべき基板を吸着して保持する吸着溝13aと封止基板12のICチップ実装位置にある封止材吸引穴12aに合わせて設けた封止材吸引貫通穴13bとを有し、封止ステージ13に対してXYZ方向に相対移動できる封止材塗布手段14が、封止基板12に実装されたICチップ11の周縁に封止材15を塗布し、封止材吸引手段16が、前記封止材吸引貫通穴12aと前記封止材吸引穴13bとを通してICチップ11に塗布された封止材15を吸引し前記ICチップ11と前記封止基板12間の隙間を前記の吸引した封止材15で強制的に充填するので、従来例では、封止基板の傾斜を利用し、10分位の長い時間をかけて封止材をICチップと基板間の隙間に流し込むのに比較して、生産性が大幅に向上する。

【0016】この場合、図2ではICチップ11全体に封止材15を塗布しているが、上記のように、ICチップ11の周縁、即ち、ICチップ11の各辺に封止材15を塗布すれば、封止材吸引手段16の吸引によって、封止材15を前記ICチップ11と前記封止基板12間の隙間に強制的に充填することができる。

【0017】又、本実施例では、封止基板12にICチップ1個を実装し封入しているが、1個には限らず、勿論、複数個の場合もある。

【0018】本発明のICチップの封止基板とICチップの封止方法とを使用するICチップの封止装置の第2実施例を図3、図4に基づいて説明する。

【0019】図3、図4において、ICチップ21が封止基板22にフリップチップ実装されている。そして、ICチップ21はIC吸着ツール26によって吸着保持されている。封止基板22が、ICチップ21をフリップチップ実装すべき位置に封止材注入穴22aを有し、封止ステージ23が、ICチップ21をフリップチップ実装すべき封止基板22を吸着して保持する吸着溝23aと前記封止基板22のICチップ実装位置にある封止材注入穴22aに合わせて設けた封止材注入貫通穴23bとを有し、封止材注入手段24が、前記封止材注入貫通穴23bと前記封止材注入穴22aとを通して封止材

25を注入し前記ICチップ21と前記封止基板22間の隙間を前記の注入した封止材25で強制的に充填するので、従来例では、封止基板の傾斜を利用し、10分位の長い時間をかけて封止材をICチップと封止基板間の隙間に流し込むのに比較して、生産性が大幅に向上する。

【0020】この場合、封入材の温度管理による粘度の調整を適正に行えば、フリップチップ実装中に、並行して封止を行うことが可能である。

【0021】又、図4のIC吸着ツール26と封止材注入手段24との上下関係を逆にすれば、重力が注入方向に作用し注入が容易になる。

【0022】

【発明の効果】本願第1発明のICチップの封止基板と、本願第3発明のICチップの封止方法と、本願第5発明のICチップの封止装置とは、封止材吸引手段が、ICチップの周縁に塗布された封止材を吸引しICチップと封止基板間の隙間を吸引した封止材で強制的に充填するので、従来例では、封止基板の傾斜を利用し、10分位の長い時間をかけて封止材をICチップと封止基板間の隙間に流し込むのに比較して、生産性が大幅に向上するという効果を奏する。

【0023】本願第2発明のICチップの封止基板と、本願第4発明のICチップの封止方法と、本願第6発明のICチップの封止装置とは、封止材注入手段が、封止材を注入しICチップと封止基板間の隙間を注入した封止材で強制的に充填するので、従来例では、封止基板の傾斜を利用し、10分位の長い時間をかけて封止材をICチップと封止基板間の隙間に流し込むのに比較して、生産性が大幅に向上するという効果を奏する。

【図面の簡単な説明】

【図1】本発明のICチップの封止基板とICチップの封止方法とを使用するICチップの封止装置の第1実施

例の斜視図である。

【図2】本発明のICチップの封止基板とICチップの封止方法とを使用するICチップの封止装置の第1実施例の断面図である。

【図3】本発明のICチップの封止基板とICチップの封止方法とを使用するICチップの封止装置の第2実施例の斜視図である。

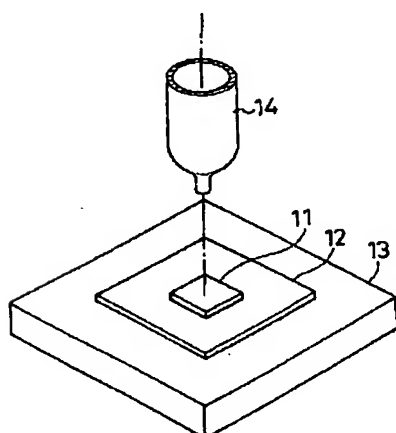
【図4】本発明のICチップの封止基板とICチップの封止方法とを使用するICチップの封止装置の第2実施例の断面図である。

【図5】従来例のICチップの封止基板とICチップの封止方法とを使用するICチップの封止装置の斜視図である。

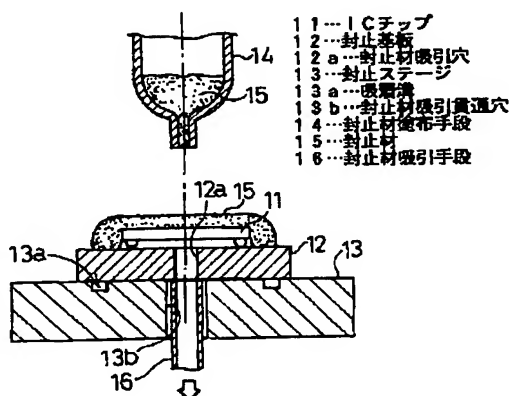
【符号の説明】

- 11 ICチップ
- 12 封止基板
- 12a 封止材吸引穴
- 13 封止ステージ
- 13a 吸着溝
- 13b 封止材吸引貫通穴
- 14 封止材塗布手段
- 15 封止材
- 16 封止材吸引手段
- 21 ICチップ
- 22 封止基板
- 22a 封止材注入穴
- 23 封止ステージ
- 23a 吸着溝
- 23b 封止材注入貫通穴
- 24 封止材注入手段
- 25 封止材
- 26 IC吸着ツール

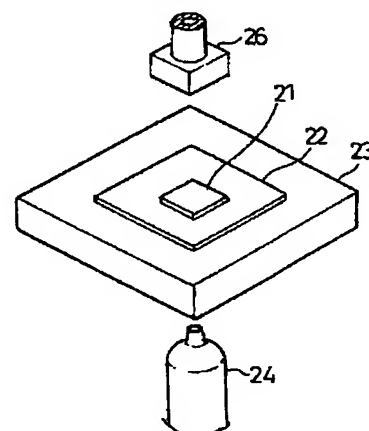
【図1】



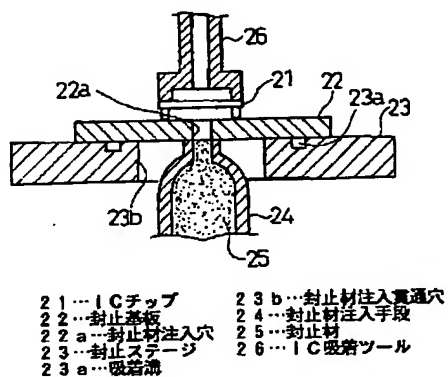
【図2】



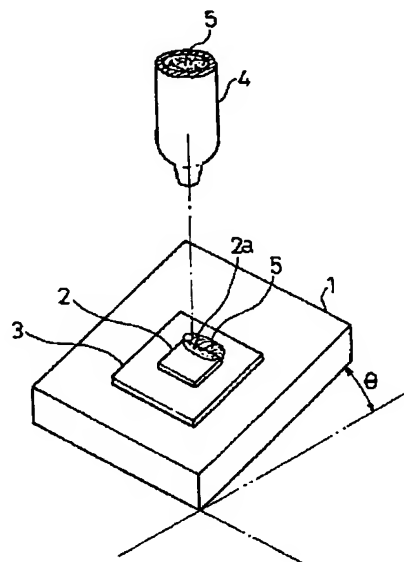
【図3】



【図4】



【図5】



フロントページの続き

(72)発明者 圓地 浩平
 大阪府門真市大字門真1006番地 松下電器
 産業株式会社内

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